1012-22-109 **Bradley N. Currey*** (`curreybn@slu.edu`), Department of Mathematics and Comp. Science, Saint Louis University, St. Louis, MO 63103. *Admissibility for a class of quasiregular representations.*

We address the question of the existence of wavelets for a class of non-commutative domains. Given a semidirect product $G = N \rtimes H$ where N is any nilpotent, connected, simply connected Lie group and where H is a vector group for which $\mathrm{ad}(\mathfrak{h})$ is completely reducible and $\mathbb{R}$-split, let τ denote the quasiregular representation of G in $L^2(N)$. An element $\psi \in L^2(N)$ is said to be admissible if the wavelet transform $f \mapsto \langle f, \tau(\cdot)\psi\rangle$ defines an isometry from $L^2(N)$ into $L^2(G)$. In this paper we give an explicit construction of admissible vectors in the case where G is not unimodular and the stabilizers in H of its action on $\hat{N}$ are almost-everywhere trivial. In this situation we prove orthogonality relations and we construct an explicit decomposition of $L^2(G)$ into G-invariant, multiplicity-free subspaces each of which is the image of a wavelet transform. We also show that, with the assumption of (almost-everywhere) trivial stabilizers, non-unimodularity is necessary for the existence of admissible vectors. (Received September 13, 2005)